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World Forum for Harmonization of Vehicle Regulations

174th session
Geneva, 13-16 March 2018
Item 2.2 of the provisional agenda
Coordination and organization of work: programme of work and documentation

Programme of Work of the World Forum for Harmonization of Vehicle Regulations (WP.29) and its Subsidiary Bodies

Note by the Secretariat*

The text reproduced below was prepared by the Secretariat for consideration by the World Forum. It takes into account the results and decisions taken at its 173rd session (ECE/TRANS/WP.29/1135) and the proposed agenda for its 174th session (ECE/TRANS/WP.29/1136) and updates also the information on the work of the six subsidiary Working Parties to WP.29.

* In accordance with the programme of work of the Inland Transport Committee for 2014–2018 (ECE/TRANS/240, para. 105 and ECE/TRANS/2014/26, cluster 02.4), the World Forum will develop, harmonize and update UN regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

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Main topics of work of the World Forum for Harmonization of Vehicle Regulations and its subsidiary bodies

Top priorities for the work of the World Forum for Harmonization of Vehicle Regulations lie in the field of automated vehicles paving the way for a regulatory framework supporting the introduction of these emerging technologies towards future autonomous vehicles and in electro-mobility to address the challenges of limited fossil fuel resources, environmental protection and climate change.

1. Further development and implementation of the three Vehicle Agreements:

1.1. **1958 Agreement**: Following the adoption and entry into force of Revision 3 of the 1958 Agreement on 14 September 2017, the requirements for International Whole Vehicle Type Approval (IWVTA) are to be implemented via the new UN Regulation No. 0.

1.2. **1997 Agreement**: Further to amending the rules under the agreement, elements related to the performance and quality of periodic technical inspections have been prepared for an adaptation of the agreement and resolution R.E.6 covering skills and training for inspectors, requirements for testing equipment and supervision of test centres was established.

1.3. **1998 Agreement**: Following the establishment of Special resolution S.R.3, the implementation of the agreement will be followed with a more strategic approach by identifying key elements that define elements the work will focus on.

2. Horizontal activities:

2.1. Over the air updates of vehicle operational software, cyber security and data protection (ECE/TRANS/WP.29/1126, para. 23) as well as connectivity (V2V, V2I) and management of "big data" related to automation and to the user's profile

2.2. Performance requirements outside test conditions (ECE/TRANS/WP.29/1126, para. 21) and whole life compliance

3. Main topics of the Subsidiary Bodies:

3.1. GRB main topic is the work on a UN GTR for Quiet Road Transport Vehicles (QRTV).

3.2. GRE is focusing on the simplification of the lighting regulations following the establishment of the Resolution R.E.5 on the common specification of light source categories.

3.3. GRPE main area of work is related to the transformation of WLTP into a new UN Regulation and further harmonization of emission and energy consumption test procedures including RDE. Alternative powertrains/fuels and development of requirements for real world vehicle performance towards sustainable transport systems.

4.4. GRRF is establishing further elements for the UN vehicle regulatory framework towards automated driving. Amendments to UN Regulation No. 79 including ACSF both for low and high speed driving manoeuvres (automated lane-change), and amendments to UN Regulation No. 131 including AEBS for light vehicles (M_1 and N_1).

4.5. GRSG establishes a new UN Regulation on Advanced Driver Assistant Systems for Blind Spot Detection to early warn drivers of not automated vehicles.

4.6. GRSP focuses its work on a UN GTR for electric vehicle safety as well as on hydrogen vehicles, protection of vulnerable road users (e.g. UN GTR /UN Regulation on pedestrian protection and child restraint systems).

Table 1
Subjects under consideration by the World Forum (WP.29)

Subject	*Document symbol ECE/TRANS/WP.29 ...*	*Documentation availability*
1.1. 1958 Agreement	For document symbols and its availability, please refer to the agenda (1134)	
1.1.1. Draft amendments to existing UN Regulations to be considered at the March 2018 session		
UN Regulations Nos.:		
6 (Direction indicators);		
13 (Heavy vehicle braking);		
13-H (Brakes of M_1 and N_1 vehicles);		
30 (Tyres for passenger cars);		
37 (Filament light sources);		
41 (Noise emissions of motorcycles);		
43 (Safety glazing);		
46 (Devices for indirect vision);		
51 (Noise of M and N categories of vehicles);		
67 (LPG vehicles);		
79 (Steering equipment);		
107 (M2 and M3 vehicles);		
110 (CNG and LNG vehicles);		
118 (Burning behavior of materials);		
121 (Identification of controls, tell-tales and indicators);		
122 (Heating systems);		
128 (LED light sources);		
140 (Electronic stability control)		
1.1.2. Draft New UN Regulation:		
positions		
1.1.3. Draft amendments to existing UN Regulations to be considered at the June 2018 session		
UN Regulations Nos.:		
13 (Heavy vehicle braking);		

Subject	Document symbol ECE/TRANS/WP.29/...	Documentation availability
13-H (Brakes of M_1 and N_1 vehicles);		
14 (Safety-belt anchorages);		
16 (Safety-belts);		
22 (Protective helmets);		
44 (Child Restraint Systems);		
49 (Compression ignition and positive ignition (LPG and CNG) engines));		
51 (Noise of M and N categories of vehicles);		
54 (Tyres for commercial vehicles and their trailers);		
63 (Noise emissions of mopeds);		
83 (Emissions of M_1 and N_1 vehicles);		
85 (Measurement of the net power);		
89 (Speed limitation devices);		
96 (Diesel emission (agricultural tractors));		
106 (Tyres for agricultural vehicles);		
108 (Retreaded tyres for passenger cars and their trailers);		
109 (Retreaded tyres for commercial vehicles and their trailers);		
120 (Net power of tractors and non-road mobile machinery);		
129 (Enhanced Child Restraint Systems);		
137. (Frontal impact with focus on restraint systems);		
139 (Brake Assist Systems (BAS));		
140 (Electronic Stability Control (ESC))		
1.1.4. Proposal for new UN Regulations to be considered at the June 2018 session		
Hydrogen and Fuel Cell Vehicles of category L;		
Mechanical coupling components of combinations of agricultural vehicles		
1.1.5. Status of the Agreement and of the annexed UN Regulations, including the latest situation report	343/Rev.26	

Subject	*Document symbol ECE/TRANS/WP.29/...*	*Documentation availability*
1.1.6. Development of an International Whole Vehicle Type Approval (IWVTA) system.		
1.1.7. Consideration of amendments to the 1958 Agreement.		
1.1.8. Development of an electronic database for the exchange of type approval documentation (DETA)		
1.2. 1998 Agreement (Global)	For document symbols and its availability, please refer to the agenda (1130)	
1.2.1. Consideration of draft UN GTRs and amendments to them:		
Proposal for a new Global Technical Regulation on Electric Vehicle Safety (EVS)		
1.2.2. Consideration of Mutual Resolutions		
Consideration of draft amendments to Mutual Resolution No. 1 (M.R.1)		
Nil		
Consideration of draft amendments to Mutual Resolution No. 2 (M.R.2)		
Nil		
Consideration of new Mutual Resolutions		
Proposal for a new Mutual Resolution (M.R.3) of the 1958 and the 1998 Agreements concerning Vehicle Interior Air Quality (VIAQ)Nil		
1.2.3. Guidance for the development of UN GTRs:		
Nil		
1.2.4. Progress on the development of new UN GTRs and of amendments to established UN GTRs		
1.2.5. Consideration of draft UN GTRs and amendments to them to be considered at the June 2018 session		
UN GTR Nos.:		
15 (Worldwide harmonized Light vehicles Test Procedures (WLTP))		
19 (Evaporative Test emission procedures for the Worldwide harmonized Light vehicles Test Procedures (EVAP WLTP))		
1.2.6. Consideration of new Mutual Resolutions		

Subject	*Document symbol ECE/TRANS/WP.29 ...*	*Documentation availability*
1.2.7. Guidance for the development of UN GTRs:		
Nil		
1.2.8. Progress on the development of new UN GTRs and of amendments to established UN GTRs		
2 (Worldwide Motorcycle emission Test Cycle (WMTC)):		
3 (Motorcycle braking):		
6 (Safety glazing):		
7 (Head restraints):		
9 (Pedestrian safety):		
13 (Hydrogen and Fuel Cell Vehicles (HFCV) – Phase 2):		
15 (Worldwide harmonized Light vehicle Test Procedures (WLTP) – Phase 2):		
16 (Tyres)		
Draft UN GTR on Quiet Road Transport Vehicles (QRTV)		
1.2.9. Exchange of views on items for new UN Global Technical Regulations		
Harmonization of side impact		
Electric vehicles and the environment		
Specifications for the 3-D H point machine		
Hydrogen and Fuel Cell Vehicles (HFCV) (UN GTR No. 13) – Phase 2		
1.3. 1997 Agreement (Inspections)	For document symbols and its availability, please refer to the agenda (E/ECE/TRANS/WP.29/1130)	
1.3.1. Future development of the Agreement		
1.3.2. Update of UN Rules Nos. 1 and 2		
1.3.3. Consideration of new UN Rules		
Proposals for a new Rule on Periodical Technical Inspections of motor vehicles using Compressed Natural Gas (CNG) and/or Liquefied Natural Gas (LNG) in their propulsion system		
Proposals for a new Rule on Periodical Technical Inspections of motor vehicles with electric and hybrid-electric propulsion system		

Table 2
Subjects under consideration by the Working Party on Noise (GRB)

Subject	*Document symbol ECE/TRANS/WP.29*	*Documentation availability*
2.1. 1958 Agreement		For document symbols and its availability, please refer to the agenda of the sixty-fifth session (GRB/2017/1)
2.1.1. Proposal for draft amendments to existing UN Regulations (1958 Agreement):		
28 (Audible warning devices);		
41 (Noise of motorcycles);		
51 (Noise of M and N categories of vehicles);		
59 (Replacement silencing systems);		
92 (Replacement exhaust silencing systems for motorcycles);		
117 (Tyre rolling noise and wet grip adhesion);		
2.2. 1998 Agreement (Global)		For document symbols and its availability, please refer to the agenda of the sixty-fifth session (GRB/2017/1)
UN GTR on Quiet Road Transport Vehicles		
2.3. 1997 Agreement (Inspections)		
Nil		
2.4. Proposal for draft recommendations or amendments to existing recommendations		
Nil		
2.5. Miscellaneous items		For document symbols and its availability, please refer to the agenda of the sixty-fifth session (GRB/2017/1)
Influence of road surface on tyre rolling sound emissions		
Definitions and acronyms in UN Regulations under the responsibility of GRB		
Proposal for amendments to R.E.3		
Development of the International Whole Vehicle Type Approval (IWVTA) system		

Table 3
Subjects under consideration by the Working Party on Lighting and Light-Signalling (GRE)

Subject	*Document symbol ECE/TRANS/WP.29*	*Documentation availability*
3.1. 1958 Agreement	For document symbols and its availability, please refer to the agenda of the seventy-seventh session (GRE/2017/1)	
3.1.1. Proposal for draft amendments to existing UN Regulations (1958 Agreement):		
6 (Direction indicators);		
7 (Position, stop and end-outline lamps);		
10 (Electromagnetic compatibility);		
19 (Front fog lamps);		
23 (Reversing lamps);		
38 (Rear fog lamps);		
45 (Headlamp cleaners);		
48 (Installation of lighting and light-signalling devices);		
50 (Position, stop, direction indicator lamps for mopeds and motorcycles);		
53 (Installation of lighting and light signalling devices for L_3 vehicles);		
77 (Parking lamps);		
86 (Installation of lighting and light-signalling devices for agricultural tractors);		
87 (Daytime running lamps);		
91 (Side marker lamps);		
98 (Headlamps with gas-discharge light sources);		
112 (Headlamps emitting an asymmetrical passing-beam)		
113 (Headlamps emitting a symmetrical passing-beam);		
119 (Cornering lamps);		
123 (Adaptive front lighting systems (AFS))		
3.1.2. Proposal for draft new UN Regulations:		
Nil		

Subject	*Document symbol ECE/TRANS/WP.29/...*	*Documentation availability*
3.2. 1998 Agreement (Global)		
Possibility to develop further UN GTRs		
3.3. 1997 Agreement (Inspections)		
Nil		
3.4. Proposal for draft recommendations or amendments to existing recommendations		
Nil		
3.5. Miscellaneous items		For document symbols and its availability, please refer to the agenda of the seventy-ninth session (GRE/2018/1)
Pending amendment proposals		
Simplification of lighting and light-signalling UN Regulations		
Amendments to the Convention on Road Traffic (Vienna 1968)		
Development of an international whole vehicle type approval (IWVTA)		
Phantom light and colour washout		
Direction for future GRE work		
Work progress of the International Automotive Lighting and Light Signalling Expert Group (GTB) task forces		

Table 4
Subjects under consideration by the Working Party on Pollution and Energy (GRPE)

Subject	*Document symbol ECE/TRANS/WP.29*	*Documentation availability*
4.1. 1958 Agreement		For document symbols and its availability, please refer to the agenda of the seventy-sixth session (GRPE/2018/1)
4.1.1. Proposal for draft amendments to existing UN Regulations (1958 Agreement):		
68 (Measurement of the maximum speed, including electric vehicles);		
83 (Emissions of M_1 and N_1 vehicles);		
101 (CO_2 emissions/fuel consumption);		
103 (Replacement pollution control devices);		
49 (Emissions of compression ignition and positive ignition (LPG and CNG) engines);		
132 (Retrofit Emissions Control devices (REC));		
85 (Measurement of the net power);		
115 (LPG and CNG retrofit systems);		
133 (Recyclability of motor vehicles);		
96 (Diesel emission (agricultural tractors));		
120 (Net power of tractors and non-road mobile machinery);		
40 (Emission of gaseous pollutants by motorcycles);		
47 (Emission of gaseous pollutants of mopeds)		
4.1.2. Proposal for draft new UN Regulations		
Nil		
4.2. 1998 Agreement (Global)		For document symbols and its availability, please refer to the agenda of the seventy-sixth session (GRPE/2018/1)
2 (Worldwide motorcycle emissions test cycle (WMTC));		
4 (Worldwide harmonized Heavy-Duty Certification Procedure (WHDC));		
5 (Worldwide harmonized Heavy duty on-board diagnostic systems (WWH-OBD));		
10 (Off-Cycle Emissions (OCE));		
11 (Non-road mobile machinery engines);		
15 (Worldwide harmonized Light Vehicle Test Procedure (WLTP))		

Subject	*Document symbol ECE/TRANS/WP.29—*	*Documentation availability*
4.2.1. Proposal for developing new UN Global Technical Regulations		
Vehicles Interior Air Quality (VIAQ)		
4.3. 1997 Agreement (Inspections)		
Nil		
4.4. Proposal for draft recommendations or amendments to existing recommendations		
Nil		
4.5. Miscellaneous items		For document symbols and its availability, please refer to the agenda of the seventy-sixth session (GRPE/2018/1)
World-wide harmonized Light vehicles Test Procedure (WLTP)		
Heavy Duty Hybrids (HDH)		
Particle Measurement Programme (PMP)		
Gaseous Fuelled Vehicles (GFV)		
Environmental and Propulsion Performance Requirements (EPPR) for L-category vehicles		
Electric Vehicles and the Environment (EVE)		
Vehicle Propulsion System Definitions (VPSD)		
Fuel Quality (FQ)		
International Whole Vehicle Type Approval (IWVTA)		
Exchange of information on national and international requirements on emissions		
Vehicles Interior Air Quality (VIAQ)		

Table 5

Subjects under consideration by the Working Party on Brakes and Running Gear (GRRF)

Subject	*Document symbol ECE/TRANS/WP.29*	*Documentation availability*
5.1. 1958 Agreement	For document symbols and its availability, please refer to the agenda of the eighty-sixth session (GRRF/2018/1)	
5.1.1. Proposal for draft amendments to existing UN Regulations (1958 Agreement):		
13 and 13-H (Braking);		
30 (Tyres for passenger cars and their trailers);		
54 (Tyres for commercial vehicles and their trailers);		
55 (Mechanical couplings);		
64 (Temporary use spare unit, run flat tyres, run flat-system and tyre pressure monitoring system);		
75 (Motorcycle tyres);		
78 (Motorcycle braking);		
79 (Steering equipment);		
89 (Speed limitation devices);		
90 (Replacement brake linings);		
106 (Tyres for agricultural vehicles);		
109 (Retreaded tyres for commercial vehicles and their trailers);		
117 (Tyres - Rolling resistance, rolling noise and wet grip);		
139 (Brake Assist Systems);		
140 (Electronic Stability Control);		
141 (Tyre Pressure Monitoring Systems);		
142 (Tyres installation)		
5.1.2. Proposal for draft new UN Regulations:		
Nil		
5.1.3. Vehicle automation		
Remote Control Parking (RCP)		
Valet Parking		
Lane Keeping Assist System (LKAS)		
Parking Assist Systems (PAS)		
Automated Controlled Steering Function (ACSF)		

Subject		*Document symbol ECE/TRANS/WP.29...*	*Documentation availability*
5.2.	**1998 Agreement (Global)**	For document symbols and its availability, please refer to the agenda of the eighty-sixth session (GRRF/2018/1)	
	3 (Motorcycle braking);		
	16 (Tyres)		
5.3.	**1997 Agreement (Inspections)**		
	Nil		
5.4.	**Proposal for draft recommendations or amendments to existing recommendations:**		
	Nil		
5.5.	**Miscellaneous items**	For document symbols and its availability, please refer to the agenda of the eighty-sixth session (GRRF/2018/1)	
	Intelligent Transport Systems (ITS)		
	Lane keeping assist system (LKAS) and Parking assist systems (PAS)		
	Automatically Commanded Steering Function (ACSF)		
	International Whole Vehicle Type Approval (IWVTA)		
	Modular Vehicle Combinations (MVC)		
	Exchange of views on innovations and relevant national activities		

Table 6

Subjects under consideration by the Working Party on General Safety Provisions (GRSG)

Subject		*Document symbol ECE/TRANS/WP.29...*	*Documentation availability*
6.1.	**1958 Agreement**	For document symbols and its availability, please refer to the agenda for the 114th session (GRSG/2018/1)	
6.1.1.	Proposal for draft amendments to existing UN Regulations (1958 Agreement):		
	39 (Speedometer/odometer);		
	43 (Safety glazing);		
	46 (Devices for indirect vision);		
	55 (Mechanical couplings);		
	60 (Driver operated controls (mopeds/motorcycles));		
	66 (Strength of superstructure (buses));		
	67 (LPG vehicles);		
	73 (Lateral protection devices);		

Subject		Document symbol ECE/TRANS/WP.29/...	Documentation availability
	105 (ADR vehicles);		
	110 (CNG and LNG vehicles);		
	116 (Anti-theft and alarm systems);		
	118 (Burning behaviour of materials);		
	121 (Identification of controls, tell-tales and indicators)		
6.1.2.	Proposal for draft new UN Regulations:		
	Automatic Emergency Call Systems (AECS)		
	Advanced Driver Assistance Systems for blind spot monitoring (ADAS).		
6.2.	**1998 Agreement (Global)**	For document symbols and its availability, please refer to the agenda for the 114th session (GRSG/2018/1)	
	Possibility to develop further UN GTRs		
	6 (Safety glazing)		
6.3.	**1997 Agreement (Inspections)**		
	Nil		
6.4.	**Proposal for draft recommendations or amendments to existing recommendations:**		
	Nil		
6.5.	**Miscellaneous items**	For document symbols and its availability, please refer to the agenda for the 114th session (GRSG/2018/1)	
	International Whole Vehicle Type Approval (IWVTA)		
	Consolidated Resolution on the Construction of Vehicles (R.E.3)		
	Event Data Recorder		
	Three-dimensional H-point machine		

Table 7
Subjects under consideration by the Working Party on Passive Safety (GRSP)

Subject	*Document symbol ECE/TRANS/WP.29...*	*Documentation availability*
7.1. 1958 Agreement		For document symbols and its availability, please refer to the agenda for the sixty-third session (GRSP/2018/1)
7.1.1. Proposal for draft amendments to existing UN Regulations (1958 Agreement):		
14 (Safety-belt anchorages);		
16 (Safety-belts);		
17 (Strength of seats);		
21 (Interior fittings);		
22 (Protective helmets);		
25 (Head restraints);		
44 (Child restraints systems);		
80 (Strength of seats and their anchorages (buses));		
94 (Frontal collision);		
100 (Electric power trained vehicles);		
127 (Pedestrian safety);		
129 (Enhanced child restraint systems)		
7.1.2. Proposal for draft new UN Regulations:		
Nil		
7.2. 1998 Agreement (Global)		For document symbols and its availability, please refer to the agenda for the sixty-third session (GRSP/2018/1)
1 (Door locks and door retention components);		
7 (Head restraints);		
9 (Pedestrian safety);		
13 (Hydrogen and Fuel Cells Vehicles)		
Side impact dummies		
Electric vehicles		
Vehicle Crash compatibility		
7.3. 1997 Agreement (Inspections)		
Nil		
7.4. Proposal for draft recommendations or amendments to existing recommendations		
Nil		

Subject	*Document symbol ECE/TRANS/WP.29/...*	*Documentation availability*
7.5. Miscellaneous items	For document symbols and its availability, please refer to the agenda for the sixty-third session (GRSP/2018/1)	
Exchange of information on national and international requirements on passive safety		
International Whole Vehicle Type Approval (IWVTA)		
3-D H point machine		
Intelligent Transport Systems (ITS)		
Definition and acronyms in UN Regulations under GRSP responsibilities		

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Item 2.3 of the provisional agenda
Coordination and organization of work:
Intelligent Transport System and automated vehicles

Proposal for the Definitions of Automated Driving under WP.29 and the General Principles for developing a UN Regulation on automated vehicles

Submitted by the Informal Working Group on Intelligent Transport Systems / Automated Driving*

The text reproduced below was prepared by the experts from Informal Working Group (IWG) on Intelligent Transport Systems / Automated Driving (ITS/AD). It is based on ECE/TRANS/WP.29/2017/145, distributed in English only during the 173th session of WP.29.

* In accordance with the programme of work of the Inland Transport Committee for 2016–2017 (ECE/TRANS/254, para. 159 and ECE/TRANS/2016/28/Add.1, cluster 3.1), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

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A proposal for the Definitions of Automated Driving under WP.29 and the General Principles for developing a UN Regulation on automated vehicles

1. The following table reflects the general principles and definitions for automated driving systems as relevant for WP.29 to date. These principles are expected to be treated as guidelines for developing a new Regulation related to automated driving systems at WP.29 if appropriate. Please note that:

(a) The control systems that intervening in case of emergency (AEB, ESC, Dead man, etc.) are not included in these definitions of automated driving;

(b) The control functions that avoid dangers caused by unpredictable traffic conditions (goods/luggage dropping, frozen road, etc.) or other drivers' illegal driving behaviors are not considered in this table.

2. A UN Regulation on Automated Driving would need to have new specific performance requirements and verification tests under various conditions as appropriate depending on each level.

3. In discussing system requirements, it is desirable to organize them by level as well as by roadway type and to include the range of vehicle types (1: parking area; 2: motorway; 3: urban and interurban road, and both automated vehicles (i.e. existing vehicle classes) and low-speed shuttle buses, pod cars, etc (i.e. new classes of vehicles).

4. The following table shows distinctive criteria of level of automated driving for the purpose of WP.29 activities to date, considering the results of discussions so far and the assumed use cases. This table should be reconsidered appropriately in accordance with each concept of automated driving system to be placed on the market in the future.

	Object and Event Detection and Response (OEDR) by the driver *The driver may not perform secondary activities*			*Object and Event Detection and Response (OEDR) by the system* *The driver may perform secondary activities*		
	Monitor by Driver	*Monitor by Driver (a)*	*Monitor by Driver (b)*	*Monitor by System (Return to Driver Control on System Request)*	*Monitor by System Full Time under defined use case*	*Monitor by System only*
Ref. SAE Level (J3016)	*1*	*2*		*3*	*4*	*5*
Outline of Classification	System takes care of longitudinal or lateral control Monitoring by the driver	The system takes care of both longitudinal and lateral control Monitoring by driver necessary because the system is not able to detect all the situations in the ODD The driver shall be able to intervene at any time		The system is able to cope with all dynamic driving tasks within its Operational Design Domain (ODD)* or will otherwise transition to the driver offering sufficient lead time (driver is fallback) The system drives and monitors (specific to the ODD) the environment The system detects system limits and issues a transition demand if these are reached * The Level 3 system is e.g. not expected to provide a corridor for emergency vehicle access or to follow hand signals given by traffic enforcement officers. The driver needs to remain sufficiently vigilant as to acknowledge and react on these situations (e. g. when he hears the sirens of an emergency vehicle in close vicinity)	The system is able to cope with any situations in the ODD (fallback included) The driver is not necessarily needed during the specific use-case, e. g. Valet Parking/ Campus Shuttle The system may however request a takeover if the ODD boundaries are reached (e g. motorway exit)	The system is able to cope with any situations on all road types, speed ranges and environmental conditions No driver necessary

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Vehicle Tasks	1. Execute either longitudinal (acceleration/ braking) or lateral (steering) dynamic driving tasks when activated. The system is not able to detect all the situations in the ODD.	1. Execute longitudinal (accelerating, braking) and lateral (steering) dynamic driving tasks when activated. The system is not able to detect all situations in the ODDs.	1. Execute longitudinal (accelerating/braking) and lateral (steering) portions of the dynamic driving task when activated. Shall monitor the driving environment for operational decisions when activated.	1. Execute longitudinal (accelerating/braking) and lateral (steering) portions of the dynamic driving task when activated. Shall monitor the driving environment for any decisions happening in the ODD (for example Emergency vehicles).	1. Monitor the driving environment.
	2. System deactivated immediately at the request of the driver.	2. System deactivated immediately upon request by the human driver.	2. Permit activation only under conditions for which it was designed. System deactivated immediately at the request of the driver. However the system may momentarily delay deactivation when immediate human takeover could compromise safety.	2 Permit activation only under conditions for which it was designed. System deactivated immediately at the request of the driver. However the system may momentarily delay deactivation when immediate human takeover could compromise safety.	2. Execute longitudinal (accelerating/ braking) and lateral (steering).
		3. No transition demand as such, only warnings.	3. System automatically deactivated only after requesting the driver to take-over with a sufficient lead time; may – under certain, limited circumstances – transition (at least initiate) to minimal risk condition if the human driver does not take over. It would be beneficial if the vehicle displays used for the secondary activities were also used to improve the human takeover process.	3. Shall deactivate automatically if design/boundary conditions are no longer met and must be able to transfer the vehicle to a minimal risk condition. May also ask for a transition demand before deactivating.	3. Execute the OEDR subtasks of the dynamic driving task- human controls are not required in an extreme scenario.
		4. A driver engagement detection function (could be realized, for example, as hands-on detection or monitoring cameras to detect the driver's head position and	4. Driver availability recognition shall be used to ensure the driver is in the position to take over when requested by the system. Potential technical solutions	4. Driver availability recognition shall be used to ensure the driver is in the position to take over when requested by transition demand. This	4. System will transfer the vehicle to a minimal risk condition.

		eyelid movement etc.) could evaluate the driver's involvement in the monitoring task and ability to intervene immediately	range from detecting the driver's manual operations to monitoring cameras to detect the driver's head position and eyelid movement	can however be lighter solutions than for level 3 because the system is able to transfer the vehicle to a minimal risk condition in the ODD	
			5. Emergency braking measures must be accomplished by the system and not expected from the driver (due to secondary activities)	5. Emergency braking measures must be accomplished by the system and not expected from the driver (due to secondary activities)	
Driver Tasks	1. Determine when activation or deactivation of assistance system is appropriate	1. Determine when activation or deactivation of the system is appropriate	1. Determine when activation or deactivation of the automated driving system is appropriate	1. Determine when activation deactivation of the automated driving system is appropriate	1. Activate and deactivate the automated driving system
	2. Monitor the driving environment. Execute either longitudinal (acceleration/braking) or lateral (steering) dynamic driving task	2. Execute the OEDR by monitoring the driving environment and responding if necessary (e.g. emergency vehicles coming)	2. Does not need to execute the longitudinal, lateral driving tasks and monitoring of the environment for operational decisions in the ODD	2. Does not need to execute the longitudinal, lateral driving tasks and monitoring of the environment in the ODD	2. Does not need to execute the longitudinal, lateral driving tasks and monitoring of the environment during the whole trip
	3. Supervise the dynamic driving task executed by driver assistance system and intervening immediately when required by the environment and the system (warnings)	3. Constantly supervise the dynamic driving task executed by the system. Although the driver may be disengaged from the physical aspects of driving, he/she must be fully engaged mentally with the driving task and shall immediately intervene when required by the environment or by the system (no transition demand by the system, just warning in case of misuse or failure)	3. Shall remain sufficiently vigilant as to acknowledge the transition demand and acknowledge vehicle warnings, mechanical failure or emergency vehicles (increase lead time compared to level 2)	3. May be asked to take over upon request within lead time. However the system does not require the driver to provide fallback performance under the ODD	3. Determine waypoints and destinations

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	4. The driver shall not perform secondary activities which will hamper him in intervening immediately when required.	4. The driver shall not perform secondary activities which will hamper him in intervening immediately when required.	4. May turn his attention away from the complete dynamic driving task in the ODD but can only perform secondary activities with appropriate reaction times. It would be beneficial if the vehicle displays were used for the secondary activities.	4. May perform a wide variety of secondary activities in the ODD.	4. May perform a wide variety of secondary activities during the whole trip.
	Consideration points on development of vehicle regulation	1. Consider whether regulatory provision for longitudinal (accelerating, braking) and lateral control (steering) are necessary.	1. Consider which regulatory provision for longitudinal (accelerating, braking) and lateral control (steering) are necessary including the monitoring of the driving environment.	1. Consider which regulatory provision for longitudinal (accelerating, braking) and lateral control (steering) are necessary including the monitoring of the driving environment for any decisions happening in the use case (for example Emergency vehicles).	Note: Preliminary analysis only - subject further review. 1. Consider which regulatory provision for longitudinal (accelerating, braking) and lateral control (steering) are necessary including the monitoring of the driving environment for any decisions (for example Emergency vehicles).
		2. Consider regulatory provision to ensure the system is deactivated immediately upon request by the human driver.	2. Consider regulatory provision to ensure the system i) Permits activation only under conditions for which it was designed, and ii) Deactivates immediately upon request by the driver. However the system may momentarily delay deactivation when immediate driver takeover could compromise safety.	2. Consider regulatory provision to ensure the system. i) Permits activation only under conditions for which it was designed, and ii) Deactivates immediately upon request by the driver. However the system may momentarily delay deactivation when immediate driver takeover could compromise safety.	2. Depending upon the vehicle configuration, consider regulatory provision to ensure the system. i) Permits activation only under conditions for which it was designed, and ii) Deactivates immediately upon request by the driver. However the system may momentarily

					delay deactivation when immediate driver takeover could compromise safety
		3. Consider the warning strategy to be used. This might include warning informing the driver in due time when an intervention by the driver is needed	3. Consider regulatory provision to ensure the system automatically deactivates only after requesting the driver to take-over with a sufficient lead time, including – under certain, limited circumstances – transition (at least initiate) to minimal risk condition if the driver does not take over. It would be beneficial if the vehicle displays used for the secondary activities were also used to improve the human takeover process	3. Consider regulatory provision to ensure the system automatically transfer the vehicle to a minimal risk condition preferably outside of an active lane of traffic if design/boundary conditions are no longer met	3. Consider regulatory provision to ensure the system automatically transfer the vehicle to a minimal risk condition preferably outside of an active lane of traffic.
		4. Consider the driver availability recognition function to evaluate the driver's involvement in the monitoring task and ability to intervene immediately. For example, as hands-on detection or monitoring cameras to detect the driver's head position and eyelid movement etc.	4. Consider regulatory provision for driver availability recognition is used to ensure the driver is in the position to take over when requested by the system.	4. Consider regulatory provision for driver availability recognition is used to ensure the driver is in the position to take over when requested by the system transition demand at the end of the ODD.	
			5. Consider regulatory provision for emergency braking measures by the system.	5. Consider regulatory provision for emergency braking measures by the system.	4. Consider regulatory provision for emergency braking measures by the system.

Examples of the necessary system performance requirements						
Override (e.g. steering, braking, accelerating) function by the driver	Necessary in general				Unnecessary when driverless mode Otherwise necessary in general. However the system may momentarily delay deactivation when immediate human takeover could compromise safety.	Unnecessary
Aspects of arrangement that ensures the driver's involvement in dynamic driving tasks (driver monitoring, etc.)	Detection of hands-off when Level 1 addresses LKAS.	Detection of hands-off.	Detecting the driver availability recognition function to evaluate the driver's involvement in the monitoring task and ability to intervene immediately (e.g. hands off detection, head and/or eye movement and/or input to any control element of the vehicle).	Detection of driver's availability to take over the driving task upon request or when required. e.g. seated/unseated. driver availability recognition system (e.g. head and/or eye movement and/or input to any control element of the vehicle).	Unnecessary when driverless operation/use case. Necessary when driver is requested to take over at the end of ODD. In these circumstances, this can be lighter solutions than for level 3 because the system is able to transfer the vehicle to a minimal risk condition in the ODD.	Unnecessary
Aspects of arrangement that ensures the driver's resumption of dynamic driving tasks (transition periods to the driver, etc.) **Aspect of transition demand procedure.**	Not applicable			Consideration of the methods used to reengage the driver following system request (including minimal risk maneuver and cognitive stimulation- if applicable the vehicle infotainment system showing non-driving relevant content to be deactivated automatically when transition demand is issued).	Unnecessary when driverless operation/use case but level 3 requirement when the end of the ODD is reached.	Unnecessary

System reliability	Consideration shall be given to evaluation of the system reliability and redundancy as necessary.				
Comprehensive recognition of surrounding environment **(sensing, etc.)**	The area to be monitored (depends on the system function)	The area to be monitored necessary for lateral and longitudinal control (depends on the system function, while recognizing it is the task of the driver to perform OEDR)	The area to be monitored necessary for lateral and longitudinal control (depends on the system function, while recognizing it is the task of the driver to perform OEDR). Additionally the system may perform OEDR function	The area to be monitored depends on the system function (Lateral and longitudinal directions). It is the task of the system to perform OEDR.	
Recording of system status (inc. system behavior) **(DSSA-Data Storage System for ACSF, EDR, etc.)**	Unnecessary	Unnecessary	The driver's operations and the system status (incl. system behavior)	The driver's operations and the system status (incl. system behavior)	The system status (incl. system behavior))

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Cyber-Security	Necessary if the information communication in connected vehicles, etc. affects the vehicle control					
Compatibility with traffic law (WP.1)	Yes	Yes	Yes	Functionalities that include a human driver, are in general allowed by the road traffic conventions, but the implementation in local traffic rules is not harmonized. Driver might not be able, for example, to perform other activities than driving, thus national traffic laws might need amendments. Following principles have been agreed upon in the WP.1 regarding side activities: Principle 1: these activities do not prevent the driver from responding to demands from the vehicle systems for taking over the driving task, and Principle 2: these activities are consistent with the prescribed use of the vehicle systems and their defined functions.	Further consideration necessary to reflect driverless systems before a conclusion can be made	Further consideration necessary to reflect driverless systems before a conclusion can be made

<table>
<tr><th colspan="5">Summary of the current conditions and the issues to be discussed (specific use cases)</th></tr>
<tr><td>Parking area</td><td rowspan="4">Already put into practice:
· Parking Assist
· LKA (draft standards)
· ACC (no specific performance requirements)
· ACSF Cat.B1 (Steering Function hands-on)</td><td colspan="2">· Automated parking by the driver's remote control (monitoring) (RCP-Remote Control Parking, CAT. A under ACSF amendment of R79)</td><td colspan="2">Requirements need to be developed</td></tr>
<tr><td>Roads exclusively for motor vehicles with physical separation from oncoming traffic (e.g. motorway)</td><td colspan="2">· Categories B2*, C, D and E* under ACSF (amendment of R79)
· Category B1 in combination with longitudinal control</td><td>· Categories B2, B2+E under ACSF (amendment of R79)</td><td>Requirements need to be developed</td></tr>
<tr><td></td><td>· ACC+ACSF (Cat.B1, Cat.C [Basic Lane Change Assist], Cat.D [Smart LCA])</td><td>· ACSF Cat. B2*
· ACSF Cat.E* (Continuous Lane Guidance hands-off)</td><td></td><td></td></tr>
<tr><td>Urban and interurban roads</td><td colspan="2">· Category B1 in combination with longitudinal Control
· To be discussed by R79 IWG ACSF
Cat. B1 in combination with C, D</td><td colspan="2">Requirements need to be developed</td></tr>
</table>

* The functions of Category B2 and Category E of ACSF are allowed in the range of level 3, but if national traffic law prohibits secondary activities, these functions will be used as level 2. In the case of level 2, appropriate driver activity recognition means shall be required for Categories B2 and E of ACSF to ensure constant continuous monitoring by the driver.

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World Forum for Harmonization of Vehicle Regulations

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Item 2.3 of the provisional agenda
Coordination and organization of work:
Intelligent Transport System and automated vehicles

Proposal for the Definitions of Automated Driving under WP.29 and the General Principles for developing a UN Regulation on automated vehicles

Submitted by the Informal Working Group on Intelligent Transport Systems / Automated Driving*

Corrigendum

On Page 11,

The footnote (below the table), correct to read:

"_____

* Under discussion"

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* In accordance with the programme of work of the Inland Transport Committee for 2016–2017 (ECE/TRANS/254, para. 159 and ECE/TRANS/2016/28/Add.1, cluster 3.1), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

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